



# Facility-level capacity to diagnose and manage advanced HIV disease in Zambia: healthcare staff perceptions

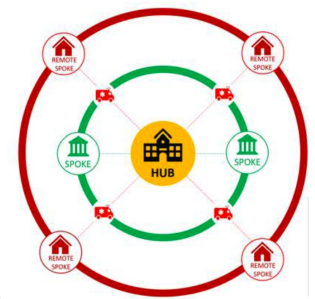
## BACKGROUND

- For clients with **advanced HIV disease (AHD)**, the first 6 months after starting or re-starting ART is a period marked by high rates of **treatment interruption and disengagement, morbidity, and mortality**.
- In Zambia, approximately **20% of HIV-positive individuals starting or re-starting ART have AHD**, but not much is known about their clinical profiles, care histories, and treatment outcomes.
- In 2022, Zambia introduced a **“hub and spoke”** model for AHD service delivery<sup>1</sup>.
  - Hubs are first-level hospitals, district hospitals, and other higher-level facilities.
  - Spokes and remote spokes are health centers, zonal clinics, health posts and other remote facilities.
  - Together, hubs and spokes are arranged to create a referral network based on expertise and infrastructure (capacity).

<sup>1</sup>Zambia AHD Implementation Framework 2022-2026

## METHODS

- We administered a **facility assessment tool** at 24 facilities (8 hubs and 16 spokes) in four provinces (Lusaka, Central, Copperbelt, Southern).
- Using Zambia’s 2021 Guidelines for Management of AHD, we examined capacity to deliver **14 guideline-mandated (essential) services at all facilities and 9 additional services at hubs only** (Panel 1).
- Facilities were asked if they could provide services to clients who needed them **on the day of assessment**.
- For the purpose of this brief, facilities that reported that they can “sometimes” provide a service when a client needs it, but not on the day of the facility assessment, were categorized as not having capacity to provide that service.



### Panel 1: Essential services recommended by national AHD guidelines, by service delivery domain

Recommended for all facilities	Recommended for hubs only	Opportunistic infection screening
<b>AHD/HIV Diagnostics</b> <ul style="list-style-type: none"> <li>HIV testing</li> <li>Viral load (VL) testing</li> <li>Point of care (POC) CD4 testing or referred (sample) CD4 testing</li> <li>WHO clinical staging</li> </ul>	<b>Adherence support</b> <ul style="list-style-type: none"> <li>Enhanced adherence counseling (EAC)</li> <li>Community/home visits</li> </ul>	<ul style="list-style-type: none"> <li>Serum cryptococcal antigen (CrAg)</li> <li>Urine LF-LAM screening</li> <li>Cerebrospinal fluid (CSF) testing</li> <li>Xpert MTB</li> <li>Opportunistic infection (OI) testing</li> <li>Microbiology</li> <li>Parasitology</li> </ul>
<b>Opportunistic infection prophylaxis</b> <ul style="list-style-type: none"> <li>TB preventive therapy (TPT)</li> <li>Fluconazole pre-emptive therapy</li> <li>Co-trimoxazole (CTX) prophylaxis:</li> </ul>		<b>Opportunistic infection treatment</b> <ul style="list-style-type: none"> <li>Fluconazole secondary</li> <li>Active pulmonary tuberculosis (PTB) treatment</li> <li>Cryptococcal meningitis (CM) treatment</li> <li>Extrapulmonary TB treatment</li> <li>Pneumocystis Pneumonia (PCP) treatment</li> <li>Severe bacterial infection treatment</li> </ul>

## RESULTS

- Although individual facilities varied in size, spokes and hubs had similar numbers of ART clients and providers.
- Nearly all spokes were located in urban settings, while 2/3 of the hubs were located in rural areas.

**Table 1. Facility characteristics**

Characteristic	Hub (8)	Spoke (16)
Total ART patients (June 2024) (median, IQR)	3,750 (2,931, 7,791)	3,424 (2,858, 5,290)
ART initiators per month (2024) (median, IQR)	21 (16, 47)	21 (16, 34)
Providers employed per facility		
HIV care providers (median, IQR)	9 (4, 15)	8 (6, 14)
AHD-trained providers (median, IQR)	3 (1, 9)	4 (3, 7)
Urban setting (n, % of facilities)	3 (37%)	15 (94%)

**Figure 1. Number of facilities with capacity to offer guideline-recommended services (n=24)**

Proportion of facilities reporting yes: ■ ≥90% ■ 80-89% ■ 70-79% ■ 60-69% ■ <60% ■ N/A

Domain	Service	Facility intends to provide service	Equipment available*	Reagents/ medications available*	Trained staff	Could provide this service today
HIV/AHD diagnostics	HIV testing	24	21	17	24	24
	Viral load testing	22	16	14	21	20
	Point of care CD4	22	20	19	22	20
	Referred CD4	22	18	17	21	20
	WHO clinical staging	24			24	24
Adherence support	EAC	23	24	18	24	24
	Community/home visits	23	20		23	21
OI prophylaxis	TPT	23		21	23	23
	Fluconazole pre-emptive	23		21	19	20
	CTX prophylaxis	23		19	22	22
OI screening	Serum CrAg	18	16	13	18	15
	Urine LF-LAM	20	18	16	20	20
	CSF testing <sup>†</sup>	5	4	0	5	5
	Xpert MTB/RIF <sup>†</sup>	6	5	5	6	6
	OI testing <sup>†</sup>	8	6	5	7	6
	Microbiology <sup>†</sup>	5	5	4	5	5
	Parasitology <sup>†</sup>	5	4	4	5	5
OI treatment	Fluconazole secondary	23		13	17	13
	Active PTB Tx	23		16	17	16
	CM Tx <sup>†</sup>	8		7	8	8
	Extra-PTB Tx <sup>†</sup>	8		8	8	8
	PCP Tx <sup>†</sup>	7		7	7	7
	SBI Tx <sup>†</sup>	8		8	8	8

\*Frequently <sup>†</sup>Services only essential for hubs (n=8)

- Sites reported high capacity to provide essential services including most AHD/HIV diagnostics, adherence support, and OI prophylaxis (Figure 1).
- Most facilities reported that they had enough trained staff to provide essential services. All sites reported that they had enough trained staff to conduct HIV testing, WHO clinical staging, and enhanced adherence counseling.
- Capacity for conducting serum CrAg testing and providing secondary fluconazole and active PTB treatment was low.
- One rural hub and four spokes (three urban, 1 rural) could provide all guideline-recommended services if a client needed them on the day of the assessment (Figure 2).
- 16/24 (67%) could provide 10-13 of these services, and 3/24 (13%) could provide 7-9 of the services.
- Thirteen facilities reported inability to provide services in two or more service delivery domains, generally attributed to equipment/reagent scarcity.
- Two sites reported that they could provide neither referred nor point of care CD4 testing on the day of the assessment.

**Figure 2. Reported capacity by site and service delivery domain**

Proportion of services facility reported they can provide: ■ >80% ■ 61-80% ■ 41-60% ■ 21-40% ■ ≤20%

Urban (U)/ Rural (R)	Number of facilities offering service/total number of services in domain																							
	Spokes (S), n=16																Hubs (H), n=8							
	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	H1	H2	H3	H4	H5	H6	H7	H8
AHD/HIV diagnosis	5/5	5/5	5/5	5/5	5/5	5/5	5/5	5/5	4/5	5/5	5/5	5/5	3/5	2/5	4/5	3/5	5/5	5/5	4/5	5/5	5/5	5/5	4/5	5/5
Adherence support	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	1/2	1/2	2/2	2/2	1/2	2/2	2/2	2/2	2/2	2/2	2/2	
OI prophylaxis	3/3	3/3	3/3	3/3	2/3	3/3	3/3	3/3	2/3	3/3	3/3	2/3	3/3	3/3	2/3	3/3	3/3	3/3	2/3	3/3	3/3	2/3	2/3	
OI screening	2/2	2/2	2/2	2/2	2/2	1/2	2/2	2/2	2/2	1/2	1/2	1/2	1/2	2/2	0/2	1/2	7/7	7/7	6/7	7/7	5/7	4/7	0/7	1/7
OI treatment	2/2	2/2	2/2	2/2	2/2	2/2	0/2	0/2	1/2	1/2	0/2	1/2	1/2	1/2	0/2	1/2	6/6	6/6	6/6	6/6	6/6	4/6	6/6	3/6

**CONCLUSIONS**

- Limitations to service provision included reagent shortages, equipment gaps for AHD/HIV diagnostics and OI screening, and/or medication availability (OI prophylaxis and treatment).
- Results are self-reported by health care staff; they do not reflect actual services provided based on clients' records.